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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/510,497

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Shunji Hayashi

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EXAMINER

BADR, HAMID R

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/510,497	Applicant(s) HAYASHI ET AL.	
	Examiner HAMID R. BADR	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6,7,9 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6,7,9 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/02/2009 has been entered.

Claims 6-7 and 9-10 are being considered on the merits.

New ground of rejections is set forth as follows.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 6-7 and 9-10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. While there is support in the specification to recite "cutting and cooking the curd" to remove the whey, there does not appear to be support to broadly recite "processing thus formed curd to remove whey" as presently claimed.

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4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 6-7 and 9-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 is indefinite for "adding a lactic acid bacteria starter to a milk component". Claim 6 is indefinite for "a milk component". It is unclear what is meant by "a milk component". It is not clear if "a milk component" is simply the milk used for making cheese or it is meant to be any component of regular milk which could comprise casein, whey powder, whey concentrate, casein hydrolyzate, etc.

Claim 6 is further indefinite for "a viable count of ". It is unclear whether the claimed viable count is the count of *Lactobacillus gasseri* or a total viable count which could include other organisms. It is not clear whether "a viable count" is defining *Lactobacillus gasseri*.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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2. Claims 6-7, and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardiner et al. (1998, Development of a probiotic cheddar cheese containing human –derived *Lactobacillus paracasei* strains; hereinafter R1) in view of DE 1955833 (hereinafter R2) and Kimura et al. (EP 1 112 692 A1, hereinafter R3)

3. R1 reports the results of a research on the preparation of cheddar cheese containing live cultures of probiotic *Lactobacilli*. R1 confirms that *L. paracasei* strains grew and sustained high viability in cheese during ripening. (Abstract).

4. R1 discloses the process of producing the cheese where an inoculum of starter cultures is added to the pasteurized milk. In addition to the starter culture, a probiotic culture such as *L. paracasei* is also added. Cheddar cheese is then produced according to the standard process known in the art. Preparation of the curd, cutting and cooking the curds are all standard processes as taught by R1. The curds are pressed and kept as pressed overnight. The cheese is then removed from mold, vacuum packed and ripened at 8C for approximately 8.5 months. (page 2193, Col. 1, Cheddar cheese manufacture).

5. Given that the cheese was kept under press at ambient temperature overnight, it is clear that the bacteria, in the cheese, were exposed to temperatures and duration as presently claimed. It is also obvious to those of skill in the art to incubate the cheese at growth temperature to allow the mesophilic microorganisms to proliferate in the cheese before cooling and storage.

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6. R1 discloses that cheese made with *L. paracasei* contained high levels of these probiotic strains after 8 months of ripening with final counts of 10^7 - 10^8 CFU/g cheese. (page 2195, Col. 1, last two lines to Col. 2, first two lines).

7. R1 concludes that the probiotic *L. paracasei* strains incorporated into cheddar cheese are found to grow and proliferate to high cell numbers in cheese over 8 months even when they are added at a relatively small inoculum. R1 further discloses that the results of the present study indicate that Cheddar cheese offers potential as an effective vehicle for delivery of these strains to the consumer. (page 2198, Col. 1, Conclusion)

8. While R1 discloses the viability of certain probiotics in cheese as a delivery matrix, R1 is silent regarding the addition of yeast extract to the milk. R1 is also silent regarding the incorporation of *Lactobacillus gasseri* into the cheese.

9. R2 discloses a process where cheese of all types of improved storage life, higher yield and improved aroma are obtained by replacing or supplementing conventional cheese cultures with Bifidus bacteria and preferably adding growth activators such as yeast extract, yeast autolysate etc. to the milk. (Abstract).

10. Given that R2 discloses the use of yeast extract or yeast autolysate in order to support and activate the growth of the probiotic organisms, it is obvious that the yeast extract should be added to the milk before the formation of curd. It is also known in the art that adjuncts such as starter cultures, calcium chloride, any coloring (if used) must be added to the milk before the formation of curd. The addition of yeast extract to the milk before the formation of the curd will help a uniform distribution of the yeast extract

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in the body of milk so that microorganisms will grow uniformly and later will be distributed more uniformly in the cheese curd.

11. While R2 discloses the incorporation of probiotics such as Bifidus bacteria in cheese, R2 is silent regarding the incorporation of *Lactobacillus gasseri* in cheese.

12. R3 teaches the use of *Lactobacillus gasseri*, with a disinfection property against *Helicobacter pylori*, in foods [0001].

13. R3 characterizes their *Lactobacillus gasseri* OLL 2716 to have high survival when applied to food products (page 3, lines 20-21). They further disclose the storage temperature of 10°C and viable count of more than 10⁷ cfu/ml of yogurt after 2 weeks (page 8, lines 5-7). Yogurt is a high water activity (a_w) food product compared to semi-hard or hard cheeses. Cheese, especially hard cheese, has a much lower water activity and under the conditions of lower water activity survival rate will be high. Consequently the limitation of claim 1 regarding the viable counts will depend on how many viable bacteria are initially present. The initial population will have a much higher survival rate when stored under the storage conditions of temperature as taught by R1.

14. R3 explains the use of *Lactobacillus gasseri* OLL 2716 (FERM BP-6999) in foods (Abstract and [0013, 0014, 0015]). Given that this organism is exactly the same as the organism in claim 10, R3 teaches that the claimed organism can be used in foods. R3 discusses the use of *Lactobacillus gasseri* in foods, in food components and in combination with other foods [0017].

15. R1 discloses the incorporation of probiotics in cheese where they can have a high rate of viability and recommends using cheese as a suitable vehicle to deliver

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such probiotics to consumers. R2 teaches of the addition of yeast extract or yeast autolysate as a growth promoter of probiotics in cheese. R3 clearly discloses the anti *Helicobacter pylori* properties of *Lactobacillus gasseri* and how dairy foods may be used containing this probiotic. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to follow the teachings of R1 to make a cheese where yeast extract is added as a growth promoter for the probiotic organisms as taught by R2 and incorporate *Lactobacillus gasseri* as an anti *Helicobacter pylori* agent, as taught by R3, into the cheese. One would do so to produce a cheese which can contain a high number of a probiotic organisms such as *Lactobacillus gasseri* and use it as an efficient matrix for delivery of probiotics to the consumers. Absent any evidence to the contrary and based on the combined teachings of the cited references, there would be a reasonable expectation of success to incorporate a probiotic organism such as *Lactobacillus gasseri* in cheese as presently claimed.

16. Claims 6-7 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable Gardiner et al. (1998, Development of a probiotic cheddar cheese containing human – derived *Lactobacillus paracasei* strains; hereinafter R1), DE 1955833 (hereinafter R2), Kimura et al. (EP 1 112 692 A1, hereinafter R3), further in view of Germond et al. (WO 0188150, hereinafter R4).

17. The disclosure by R1, R2 and R3 are hereby incorporated by reference as outlined in paragraphs 3-15 above. R1-R3 are silent regarding the incorporation of *Lactobacillus gasseri* in cheese.

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18. R4 discloses the incorporation of *L. gasseri* in dairy products including cheese.
(page 3, lines 28-30; page 6, lines 2-4)

19. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made to follow the teachings of R1, R2 and R3 to make a cheese where yeast extract is added as a growth promoter for the probiotic organisms and incorporate *Lactobacillus gasseri* as an anti *Helicobacter pylori* agent directly into the cheese as disclosed by R4. One would do so to produce a cheese which can contain a high number of a probiotic organism such as *Lactobacillus gasseri* and use it as an efficient matrix for delivery of probiotics to the consumers. Absent any evidence to the contrary and based on the combined teachings of the cited references, there would be a reasonable expectation of success to incorporate a probiotic organism in cheese as presently claimed.

Response to Arguments

Applicants' argument regarding the survival rate of the bacteria has been reviewed. That argument is not persuasive for the following reasons.

1. Applicants argue that the survival rate (of bacteria in the cheese) depends on the conditions for bacterial growth. Applicants further state that it is well known in the art that it is not easy to increase the number of lactic acid bacteria in cheese because water activity is low in cheese.

a. Applicants attention is drawn to the following. Firstly, when survival is discussed, it should be addressed regarding the duration of time the cheese stays at storage,

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simply because one tries to have live organisms at the consumption point. It is true that one starts with a given number of bacteria at the beginning, however, what is left at the end of the storage time will determine the survival rate. Therefore, while the bacteria will proliferate at the beginning of the cheese making process, their viability and survival will depend on other dominating factors during storage such as low water activity, low oxidation-reduction in the environment and low temperature of storage which causes a decrease in metabolic rate which will have a preserving effect.

Considering the two statements that the applicants are stating, it appears the statements are contradictory. The first statement says that survival rate depends on the conditions for bacterial growth. The second statement denies the increase in the number of bacteria because the water activity is low in cheese. As it was mentioned above, it is true that at the beginning of the process, the microorganisms should proliferate and increase in number, however, thereafter at storage temperature of below 10C, as presently claimed, there will be no growth and the microorganisms will survive if water activity is low, if oxygen tension is low and if storage temperature is low.

Therefore, during storage, these factors will determine the viability and the survival of the microorganism in cheese.

Furthermore, the sensitivity of lactic acid bacteria to high water activity, for long term preservation, is known in the art. Therefore, low water activity will always be beneficial to lactic acid bacteria for survival in storage. It is of course very clear that for growth in a medium, high water activity is necessary. This is a known fact to microbiologists.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HAMID R. BADR whose telephone number is (571)270-3455. The examiner can normally be reached on M-T 5:30 to 4:30 (Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on (571) 272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hamid R Badr
Examiner
Art Unit 1794

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1794